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Jewels of the Cosmic Deep: Messier's first guide to the night sky

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JEWELS of the COSMIC DEEP

Messier's first guide to the night sky

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12 March 2010

M78 IN ORION

Storyline

- What is the Messier Catalog?
- Who was Charles (“Chuck”) Messier?
- Some highlights of the catalog
- Messier Marathon!

Out under the sky...

- Every night when you head out under the skies, you have to know one thing: what am I going to look at tonight?

Out under the sky...

- Just point the telescope!

- You don’t always see something!
- You’ll see something (probably stars) but not always interesting things!


M33


M8 (LAGOON)


M103

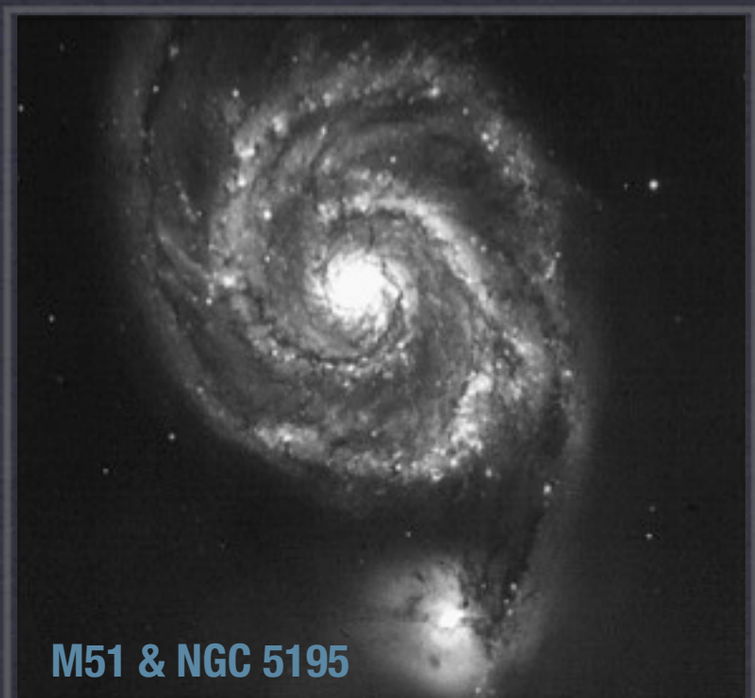
Out under the sky...

- Look through someone else's telescope!

- Don't always see what you want to see!
- You don't get to learn the sky!
- Their telescope probably isn't as good as yours. :-)


NGC 404


M50


M51 & NGC 5195

Out under the sky...

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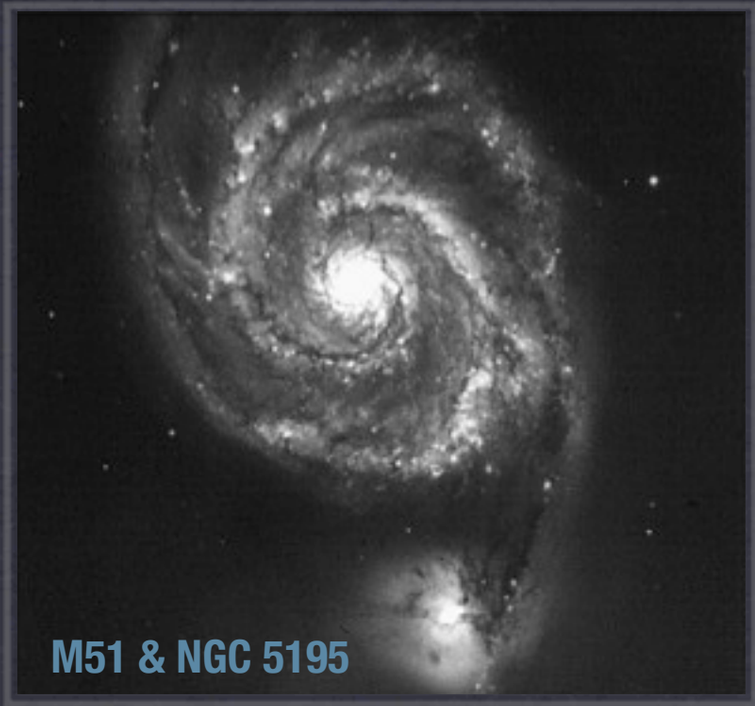
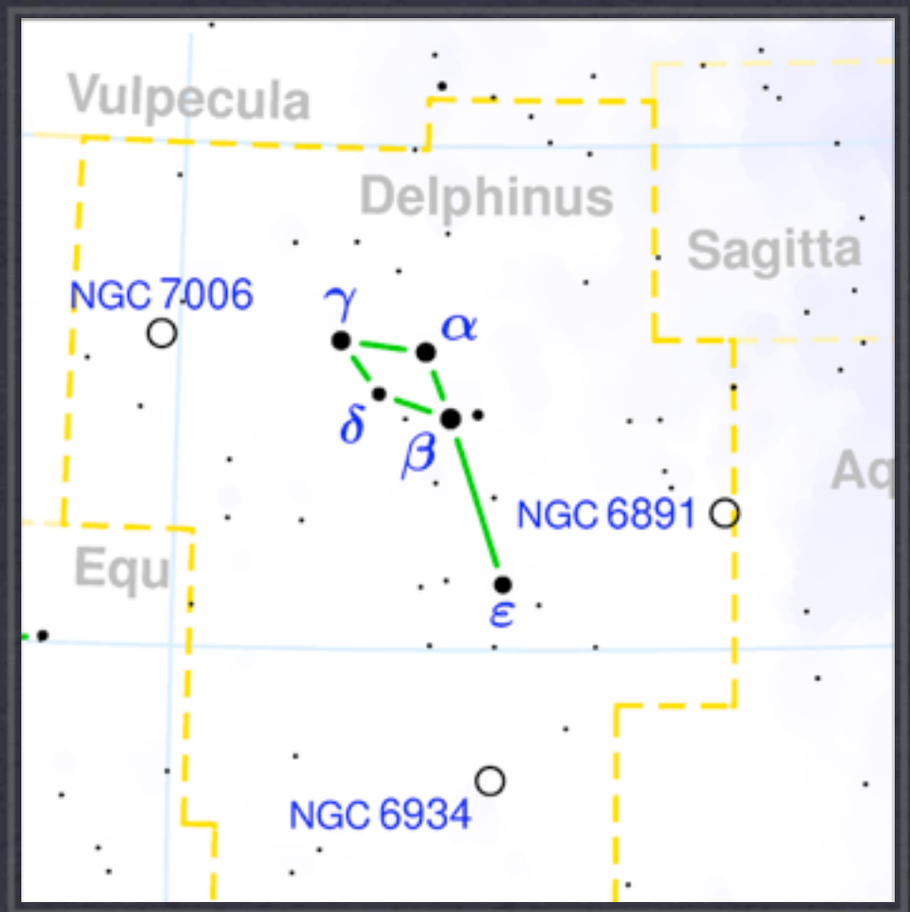
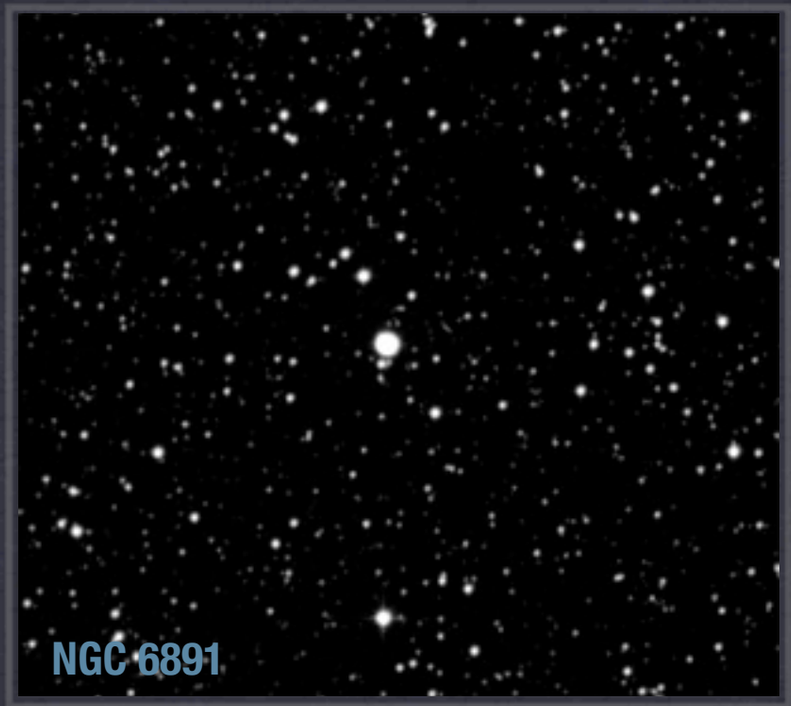

M51 & NGC 5195

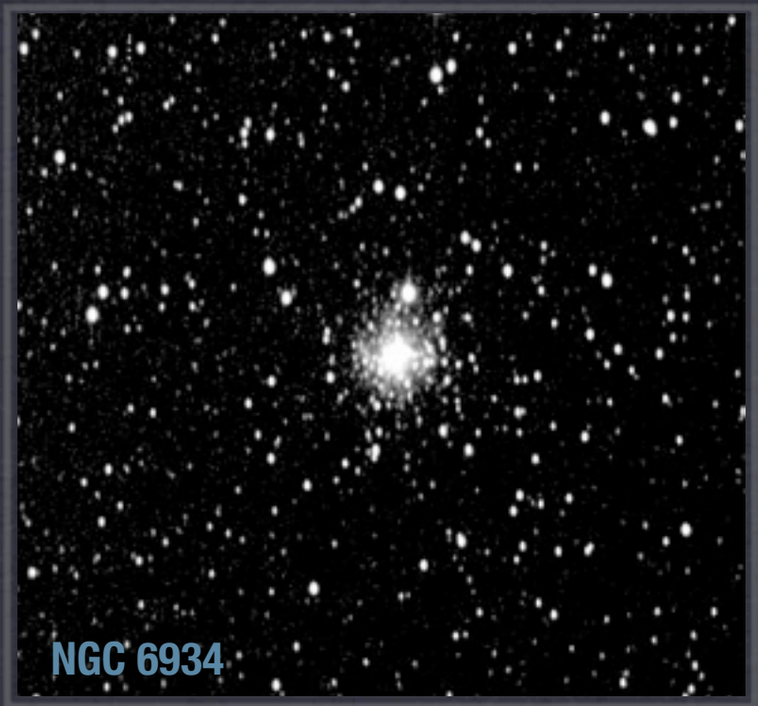
Out under the sky...

- Target Constellation!

- Just pick a constellation you can see, and look at whatever is there
- How bright is the stuff you try to see?

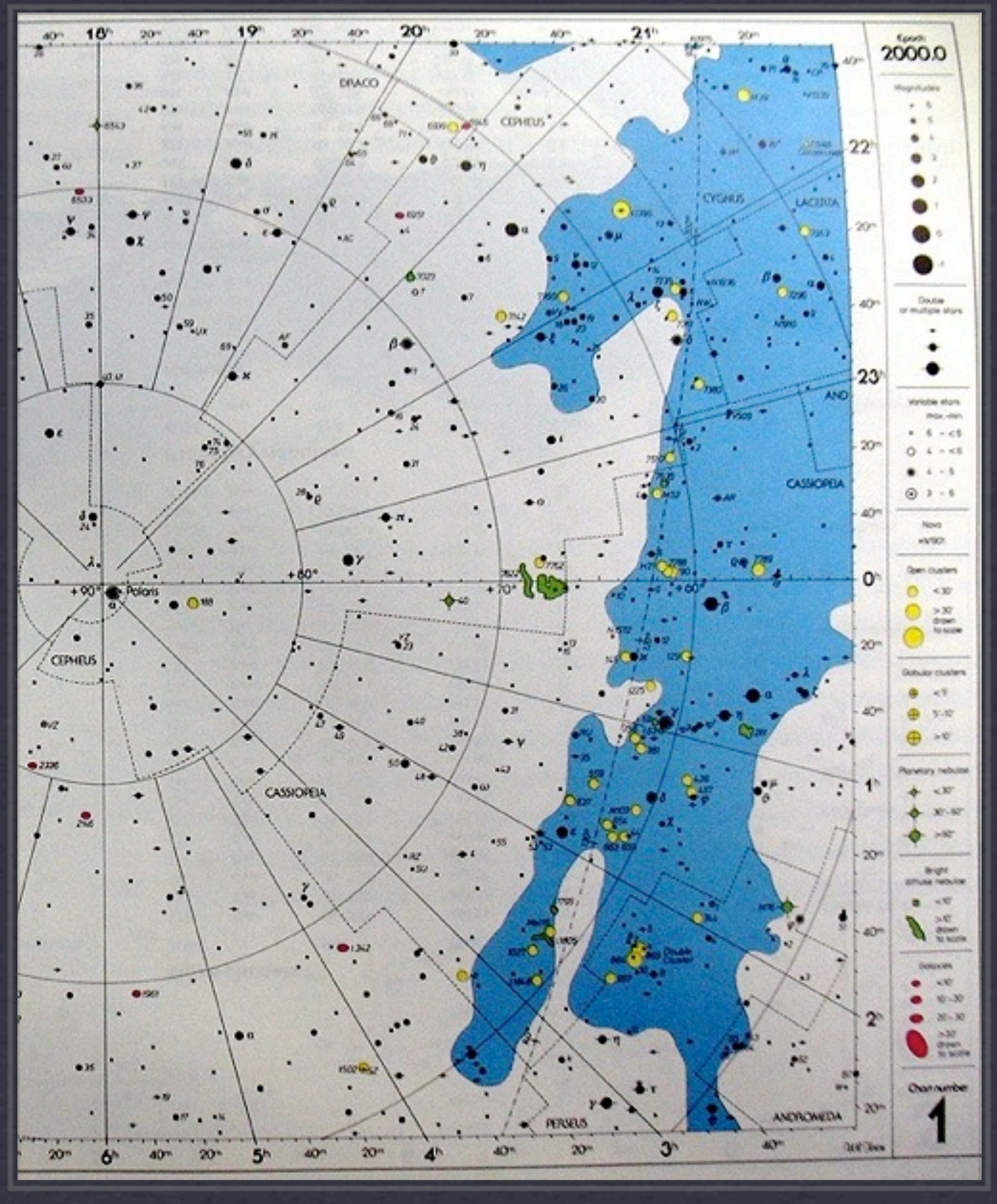






Out under the sky...

- Planned Project!
- You have to plan ahead of time!
- Need a project idea!
  - All globular clusters
  - “50 to the Pole”
- So what do I do? How can I figure out what I should look for when I go out at night?



Sky Catalogs...

- Use a sky catalog!
- A sky catalog is a list of objects with useful information that can be used while observing
  - Name, Sky Location
  - Object Type, Brightness

NGC#	Con	Type	ra	dec	B	D	d
205	And	6	00 40.4	+41 41	8.5	17x10	2900
224	And	5	00 42.7	+41 16	3.4	178x63	2900
221	And	6	00 42.7	+40 52	8.1	8x6	2900
581	Cas	1	01 33.2	+60 42	7.4	6.0	8.5
598	Tri	5	01 33.9	+30 39	5.7	73x45	3000
628	Psc	5	01 36.7	+15 47	9.4	10.2x9.5	35000
650	Per	3	01 42.4	+51 34	10.1	2.7x1.8	3.4
1039	Per	1	02 42.0	+42 47	5.5	35.0	1.4
1068	Cet	5	02 42.7	-00 01	8.9	7x6	60000
0000	Tau	1	03 47.0	+24 07	1.6	110.0	0.38
1904	Lep	2	05 24.5	-24 33	7.7	8.7	42.1
1912	Aur	1	05 28.4	+35 50	7.4	21.0	4.2

- There are several common ones we encounter as amateurs
  - NGC – “New General Catalog” [7840]
  - IC – “Index Catalog” [5387]
  - Caldwell Catalog [109]
  - Messier Catalog [109*]

M77 (NGC 1068)

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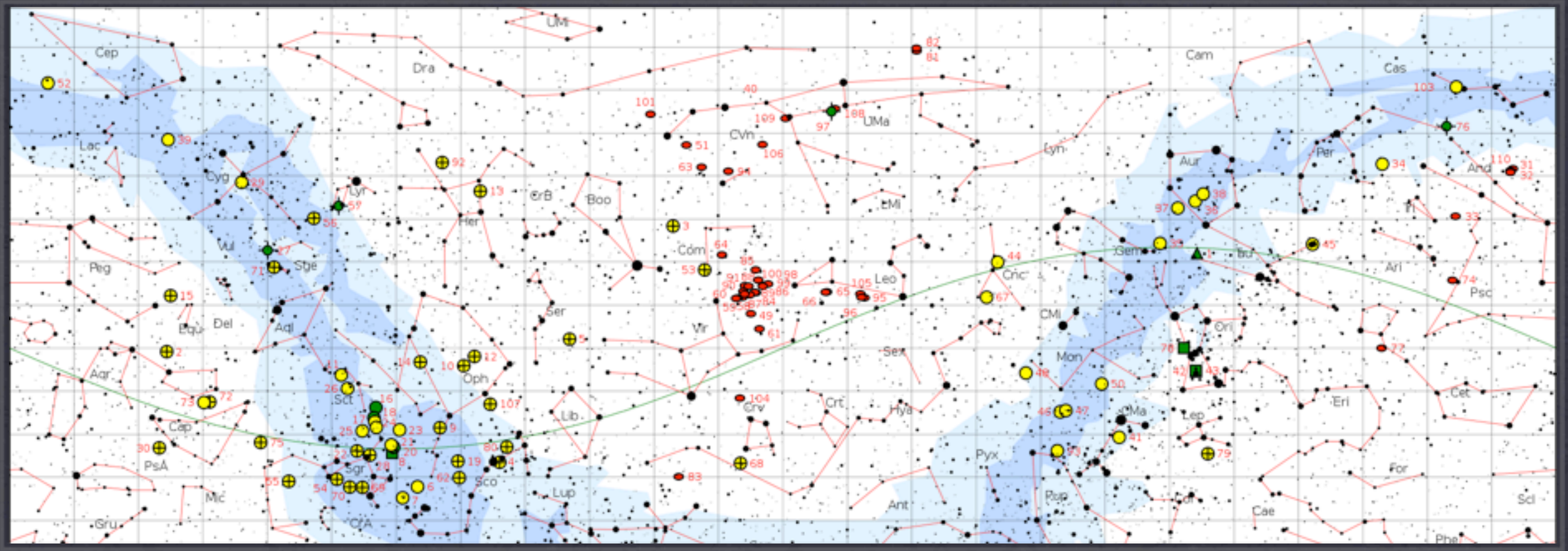
The Messier Catalog



- The Messier Catalog is a collection of 109 deep sky wonders
- Every major type of object is represented: galaxies, bright nebulae, globular clusters, open clusters, planetary nebulae
- Many visible to naked eye, lots with binoculars, and all with scopes of ~4” aperture or larger (especially from a dark site)
- Entire catalog visible to Northern Hemisphere observers who live below ~55° N latitude (southern tip of Alaska panhandle)

Charles Messier

- The Catalog was originally compiled by Charles Messier (1730-1817)
- Interest in astronomy inspired at the age of 13 by the apparition of the Great Comet of 1744
- Messier's passion was comets, and he discovered 13 comets during his career
- The Messier Catalog were permanent deep sky "fuzzies" that frustrated Messier because they looked like transient objects (comets) that he was interested in finding
- 22 catalog entries were discovered by Pierre Mechain, who worked with Messier
  - 1771 [45 Objects]
  - 1781 [103 Objects]
  - 1921 [104 Objects]
  - 1947 [107 Objects]
  - 1960 [110 Objects]

What's with M102?

- It is widely believed that M102 is an "error" in the Messier Catalog – a duplicate observation of M101.

- Mechain claimed it was an error, but everyone is still uncertain because we don't know what the error was!

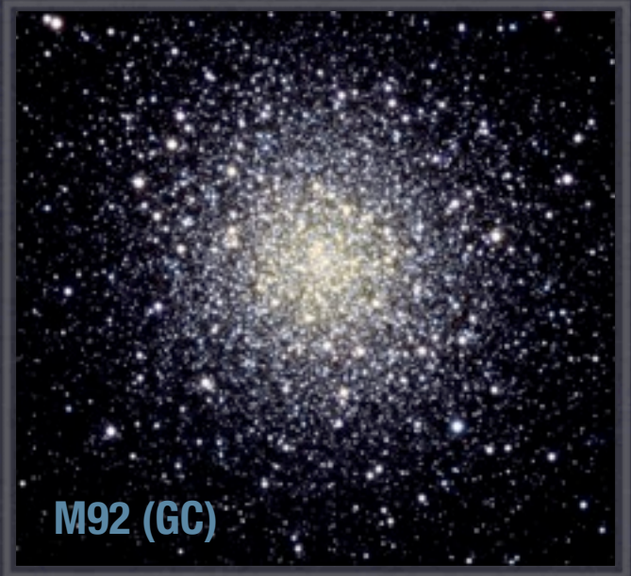
- Could be any number of other objects:
  - NGC 5866, NGC 5879, NGC 5907, NGC 5908

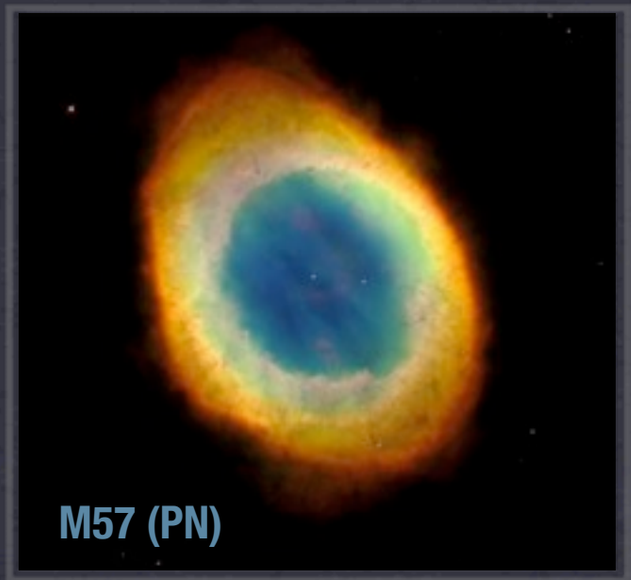
- Shane's secret idea!

Taxonomy

- **Galaxy**: gravitationally bound collection of billions of stars
- **Globular Cluster**: ~spherical, gravitationally bound collection of hundred thousand to millions of stars; typically old
- **Open Cluster**: loosely bound collection of 10's to thousands of stars; typically young
- **Bright Nebula**: collection of gas and dust in the galaxy, often giving birth to new stars. Illuminated by nearby stars
- **Planetary Nebula**: shell of gas thrown off by sun-like stars near the end of their lives. Round, so they kind of look like "planets" in scope
- **Dark Nebula**: unilluminated gas, in front of other bright objects

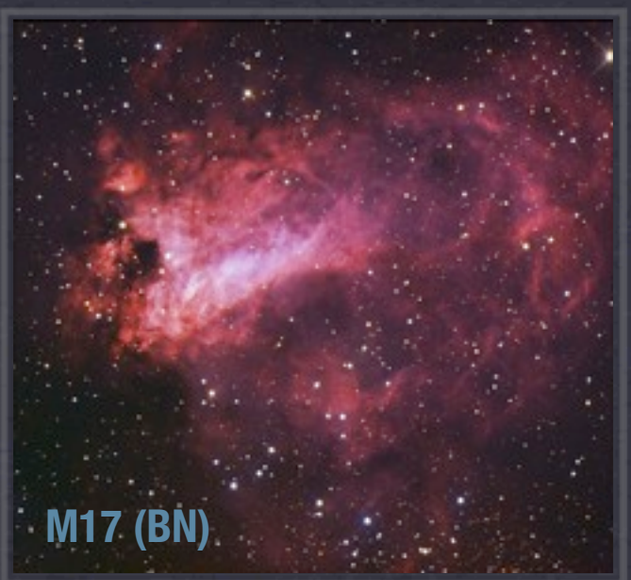

M101 (GX)

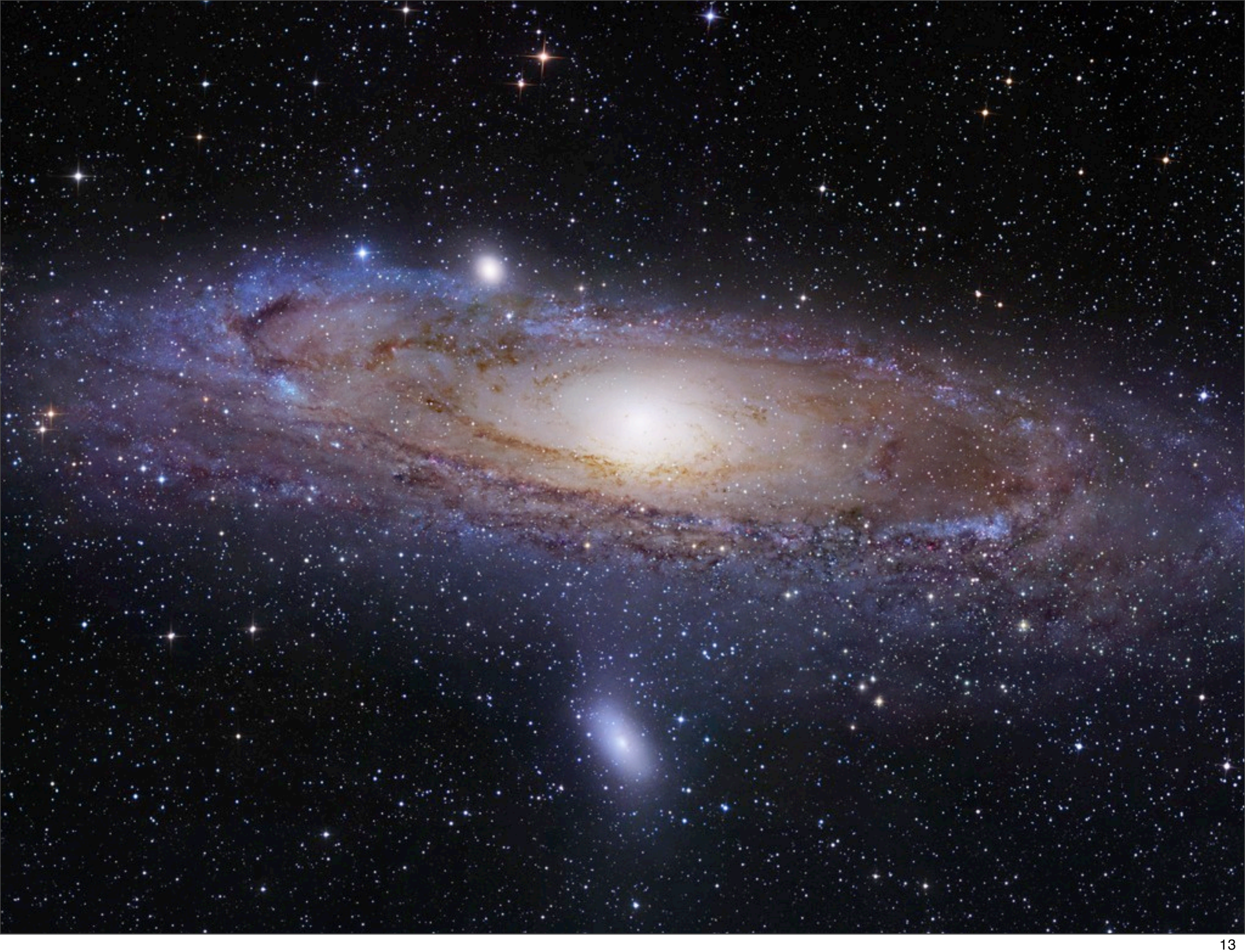

M92 (GC)


M57 (PN)


M7 (OC)

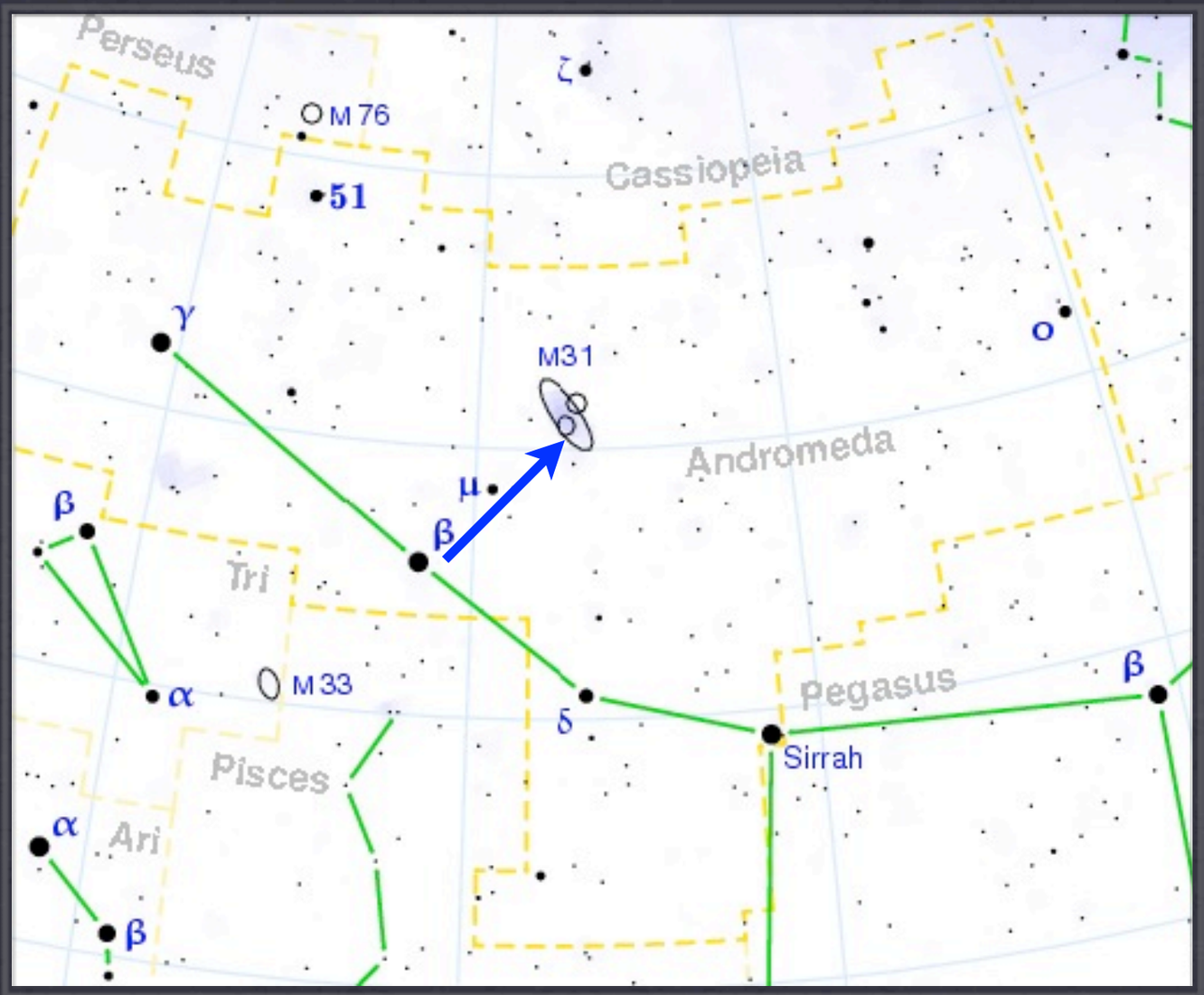

M20 (DN)


M17 (BN)



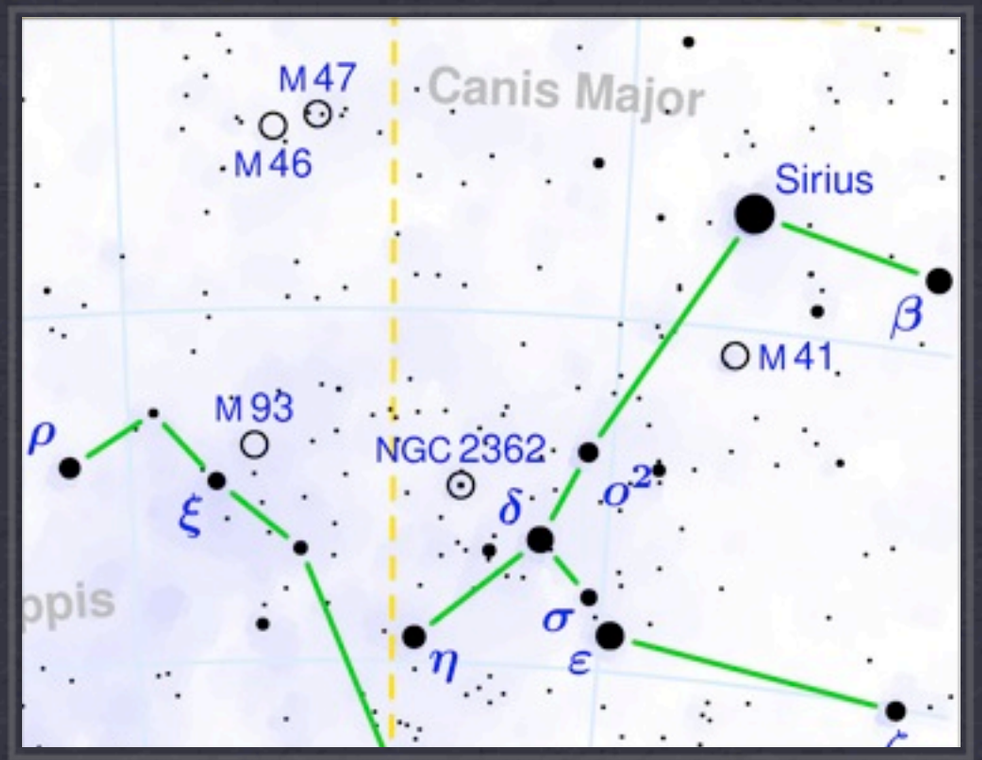
M31: The Andromeda Galaxy

- **Visible to the naked eye!**
- **2.1 Million lightyears away – closest galaxy to us that is similar to the Milky Way**
- **Nearby satellites: M32 & M110**



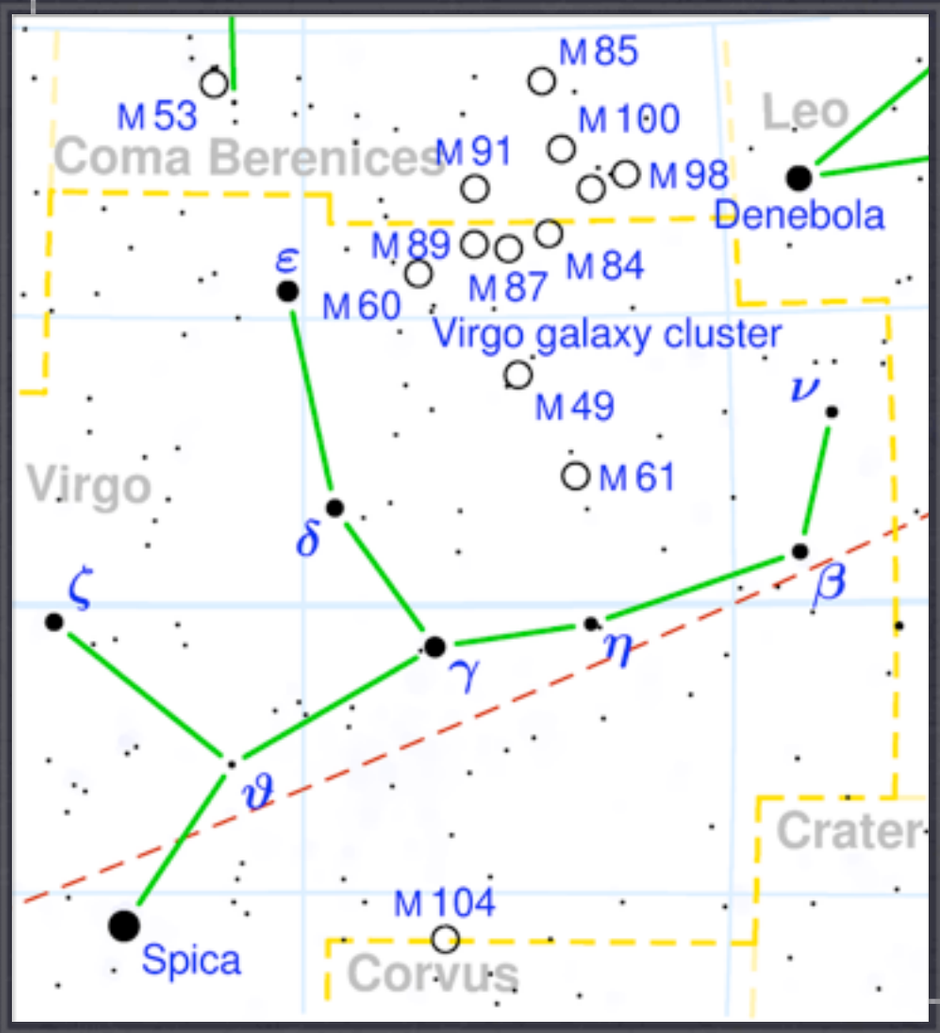
M46: Open Cluster with Planetary Nebula

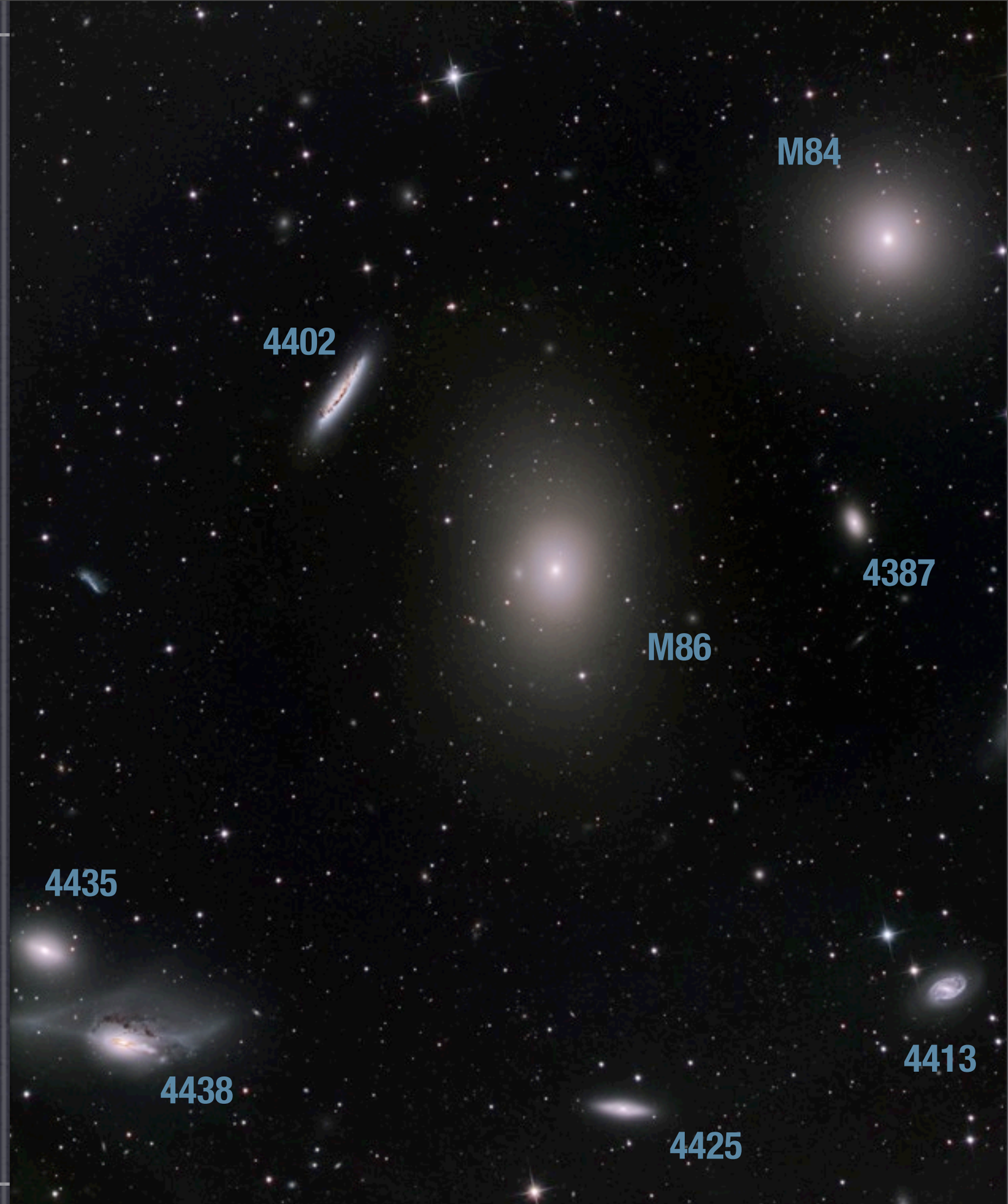
- **M46 is a young cluster of about 150 visible stars. On the fringes, you see a small planetary nebula called NGC 2438**
- **NGC 2438 is not a member of the cluster. If it were, we'd have a mystery. Why?**
- **M46 is an open cluster, made of young stars, but planetary nebulae form late in a star's life!**



Virgo Cluster

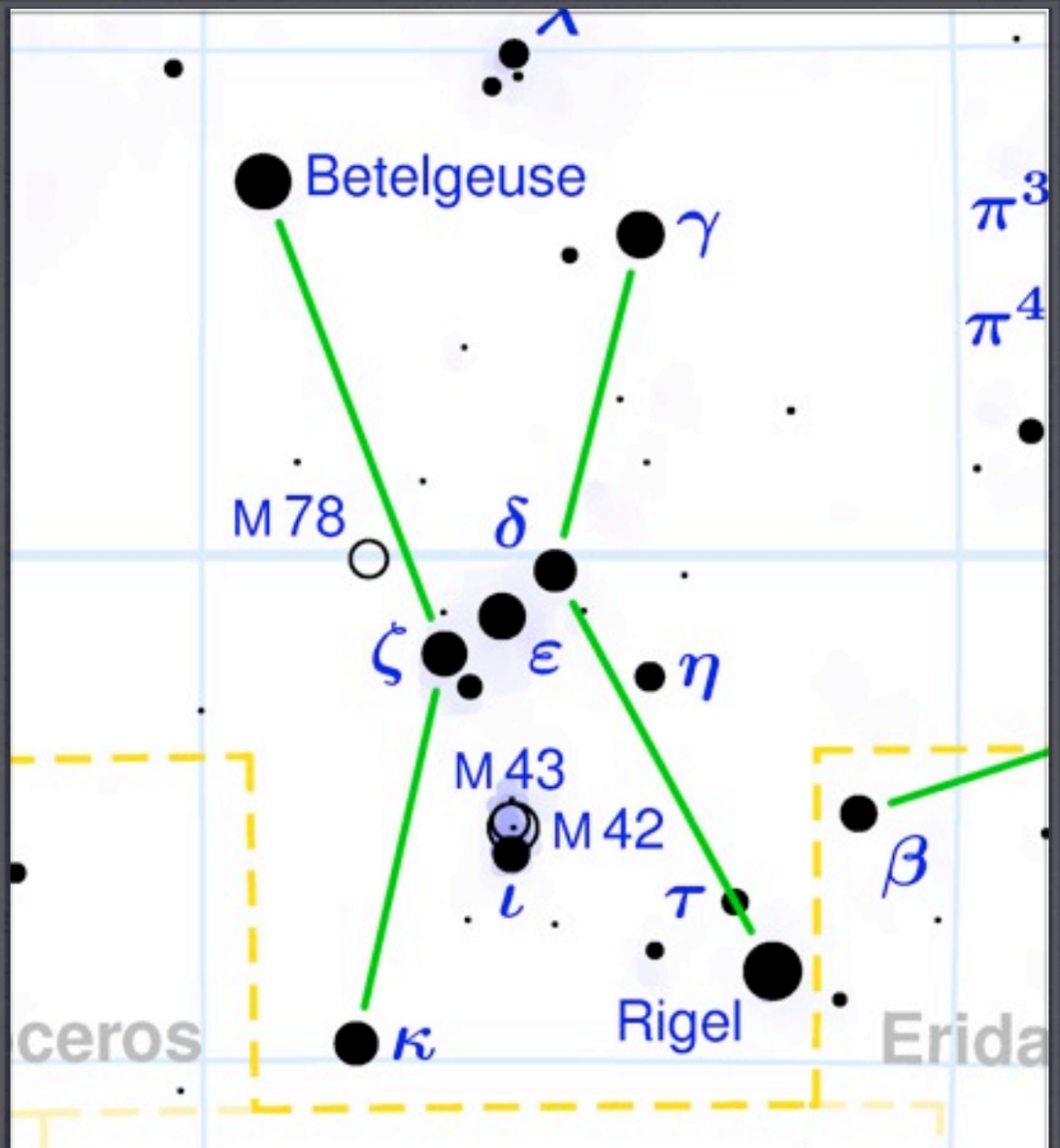
- The Virgo Cluster is a group of ~2000 galaxies located ~ 60 million lyr away
- Sometimes, you go looking for one galaxy, and you'll see **MORE THAN ONE**





M42: Orion Nebula

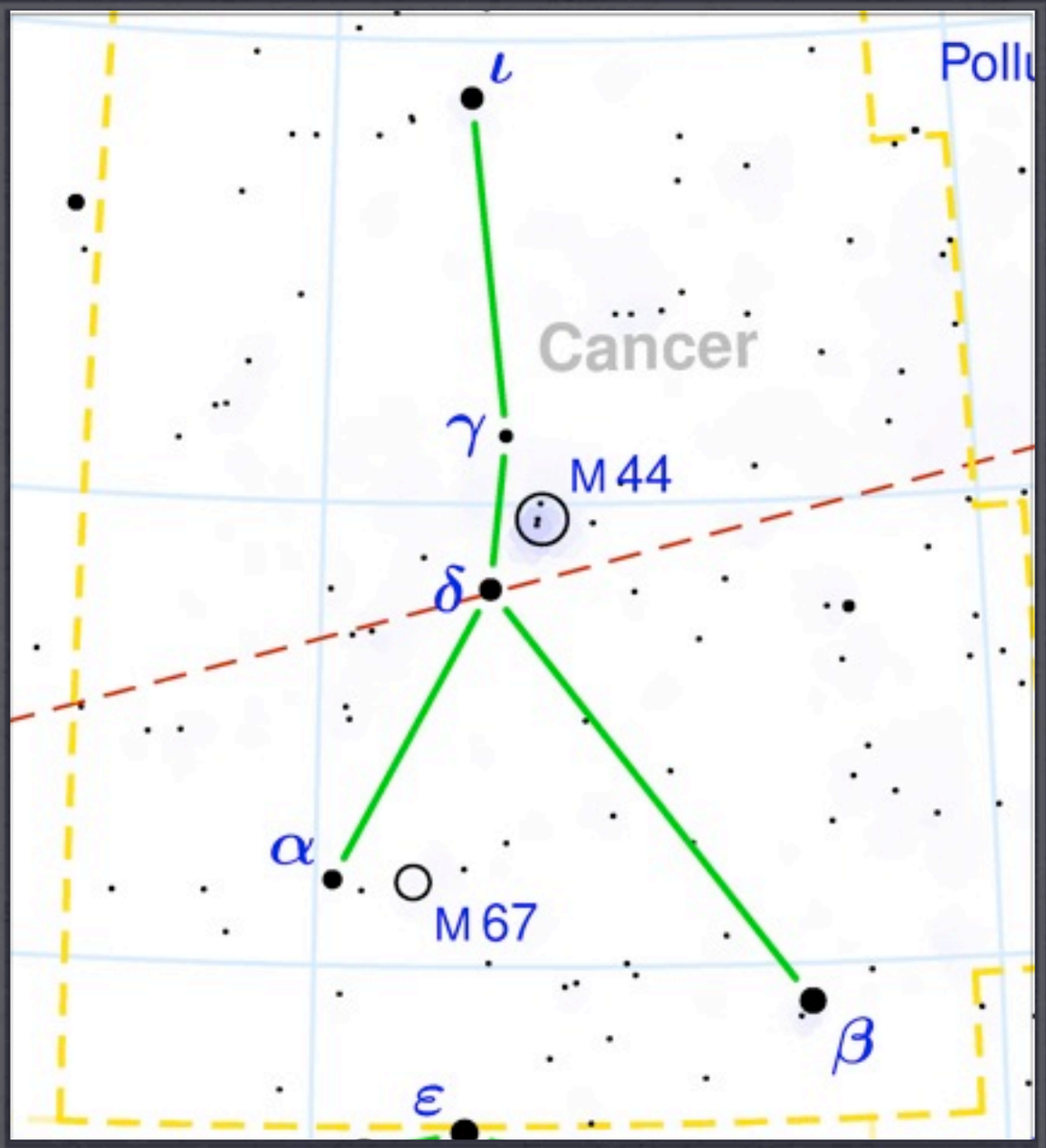
- **Brightest nebula in the sky**
- **Stellar nursery. Nebula is illuminated by bright young stars**
- **M43 is bright part on the back**



M42: Orion Nebula

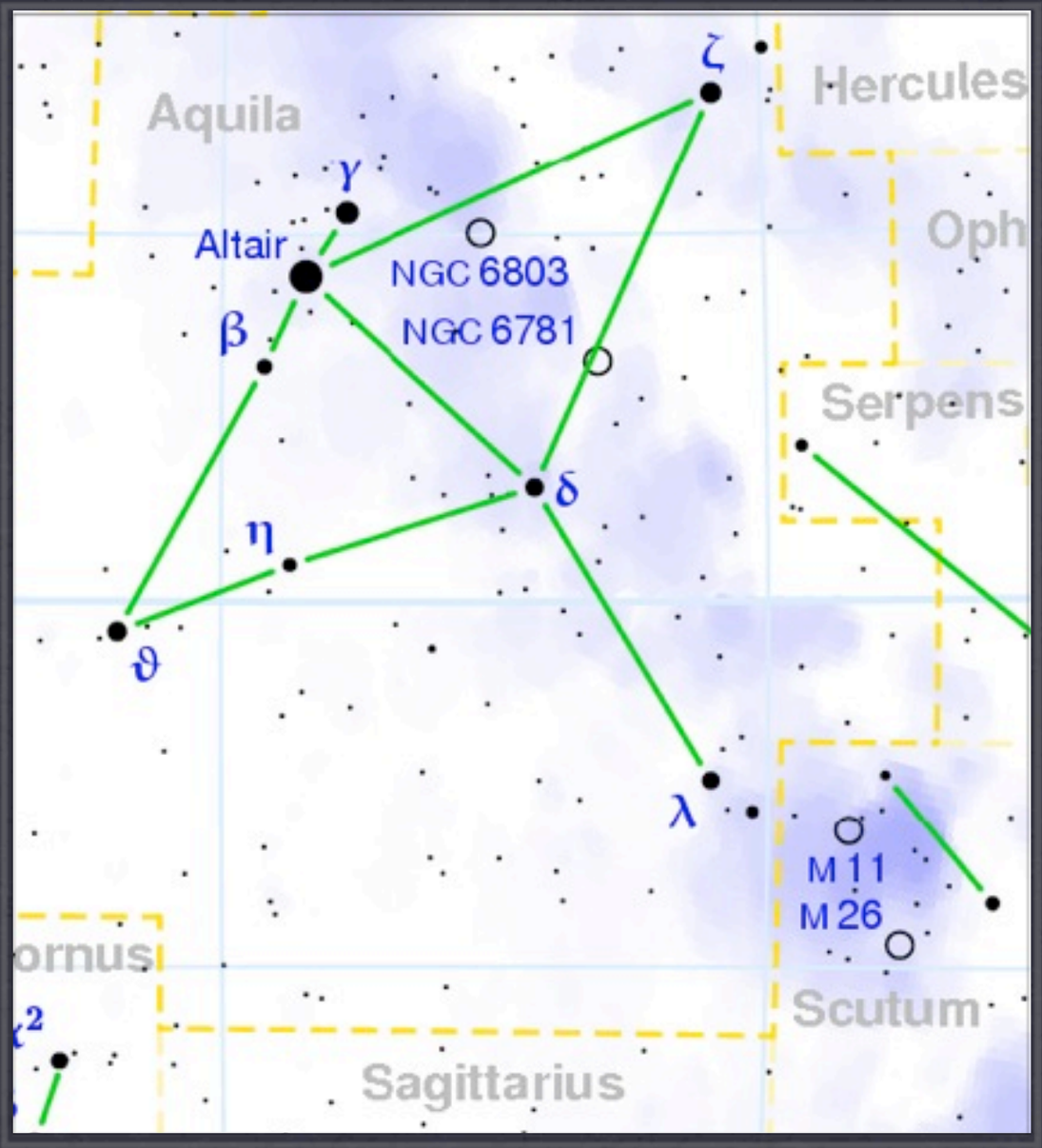
M44: Praesepe (Beehive Cluster)

- **Brighter than any star in Cancer!**
- **Naked eye visible, spectacular in binoculars!**
- **Overhead ~10pm in March**



M11: The Wild Duck Cluster

- **Open cluster faintly visible as a bright patch in the Milky Way**
- **Great sight in binoculars; looks like “Crushed Ice”**

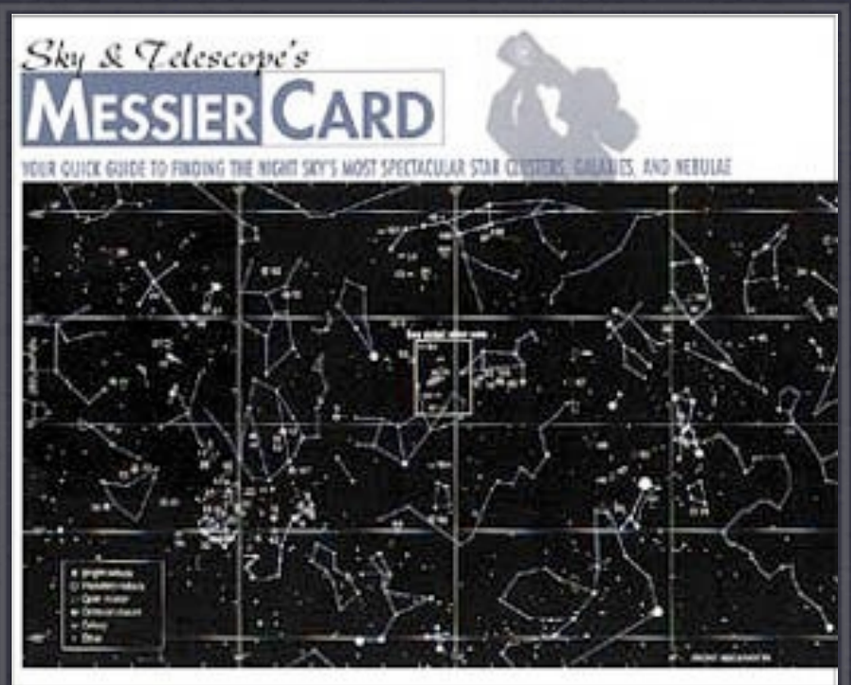


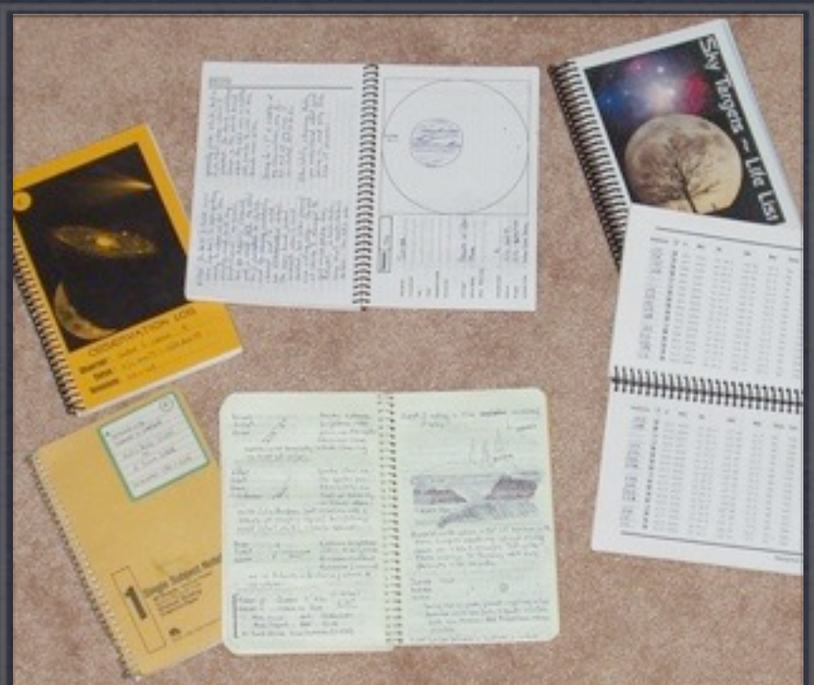
Messier Marathon!

- Every year, during the new moon in March, you can (attempt to) see all 109 Messier Objects in one night!
- Have to get the first one (usually M77 in Cetus) right after sunset.
- Scramble to get the last one (typically M30 in Capricorn) right before sunrise.
- A well prepared starhopper can compete with a computerized scope!

Essential (?) Equipment

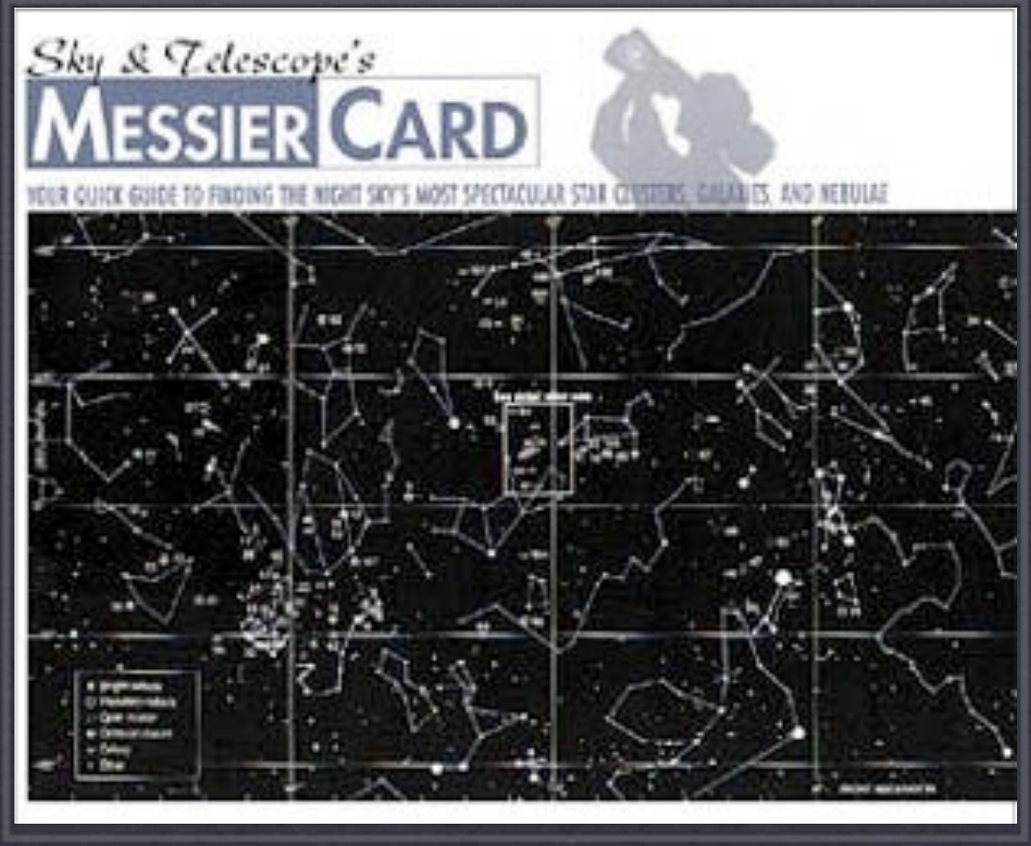
- I without fail carry a few essential things with me all the time
  - HAT/GLOVES/COAT
  - Redlight/GLP
  - Logbooks
  - Planisphere
  - Messier Card

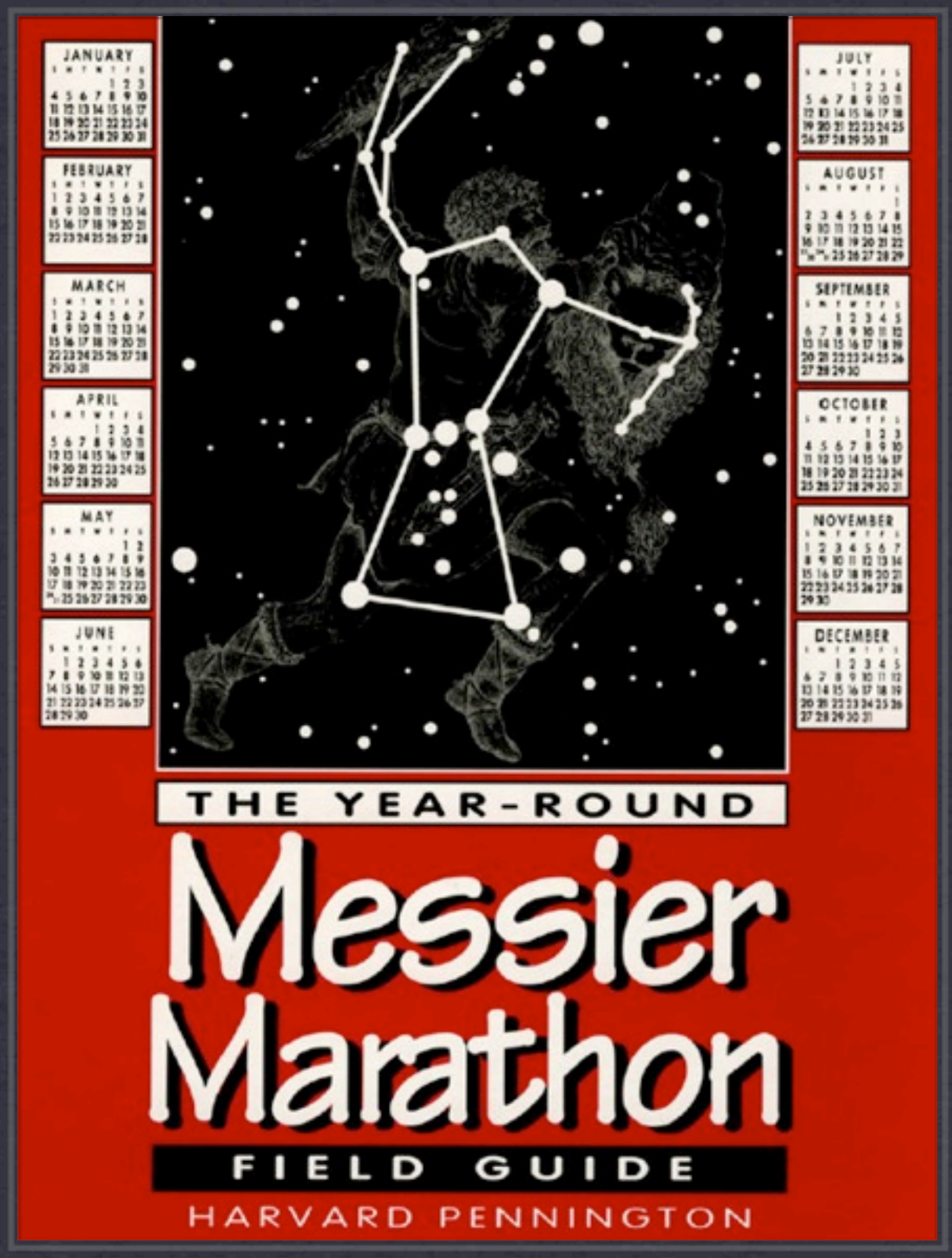




Guides

- Messier Card and a star atlas will be enough to find all 110 objects!
- Many printable lists exist on the web.
- Stephen O'Meara's book is excellent and full of interesting tidbits on observing and history, as well as O'Meara's sketches
- My favorite is The Year Round Messier Marathon Field Guide by Harvard Pennington





Astronomical League Observing Clubs

- If you keep track of your observations, the Astronomical League has several observing clubs related to the Messier Catalog

- There are 32 different observing clubs — things to look for!

Last Thoughts…

- The Messier Objects are just the beginning of observing, but you will always come back to them for a visit. They become your old friends!

- Spring's here – let's get out an observe!

Thanks!